Course Information for Math 808

Instructor:	Tamon Stephen
Meeting Time:	W 3:30–5:20 and F 2:30-4:20 in SUR 2980 (tentative)
Office:	2886 Podium 2
Office Phone:	778–782–7429
E-mail:	tamon@sfu.ca
Web page:	http://www.math.sfu.ca/~tstephen/Teaching/1141_Math808/
Office Hours:	Following class and by appointment.
Text:	Introduction to Linear Optimization by Bertsimas and Tsitsiklis
Grading:	20% Homework, 20% Presentation, 20% Midterm, 40% Final.

1. **Syllabus.** In this course, we begin by reviewing the simplex method, including examples of cycling and the Klee-Minty cube, sensitivity analysis and techniques for handling large scale problems such as decompositions and column generation. We then proceed to the ellipsoid method and why it is a fundamental but problematic technique in establishing polynomial-time algorithms for linear programming and other combinatorial optimization problems. Finally, we discuss interior point methods for linear programming, including affine scaling and logarithmic barriers. Time permitting, there will be a short introduction to semidefinite programming.

2. **Graduate student projects.** Near the end of the term, graduate students will each give a presentation on a research paper from the mathematical literature. The presentation should describe the results in the paper, as well as their context, and should be at a level where it will be understandable to the undergraduates in the class. There may be an option to give these presentations at the SFU Operations Research Seminar series rather than in class. The papers will be chosen in conjunction with the instructor.

    The presentation will normally be done using overheads projected from a computer and the overheads will also be submitted as part of the project.

3. **Homework.** There will be five homework assignments during the term. Late homework will not be accepted.

    You are encouraged to talk with each other and the instructor about the homework, but you must write up the solutions yourself, using your own words.

4. **Exams.** Books, notes and calculators cannot be used on these tests. Students **must** plan to take the tests at their scheduled times.

    The tentative dates and times for the tests are:

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    Midterm: Wednesday, March 5th, 2:30-4:20 PM  (in class)
    Final: Early April, to be arranged.
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5. **Religious Accommodations.** Students requesting religious accommodation must tell the instructor by the end of the first week of term.

6. **Reserve Books.** There is a copy of the course text on reserve at the SFU Surrey library. Additionally, there are three textbooks that cover similar ground: Chvatál's *Linear Programming*, Matoušek and Gärtner's *Understanding Linear Programming* and Schrijver's *Theory of Linear and Integer Programming*. A new on-line textbook that covers the first half of this course is Jon Lee's *A First Course in Linear Optimization*, available for download here. There are also two books that provide interesting supplementary material, Barvinok's book on convexity and Papadimitriou and Steiglitz' book on algorithms and complexity.

7. **Software.** Depending on interest and the availability of computational resources, there may be a short introduction to a prominent commercial optimization package.

8. **Questions.** Questions are encouraged in class and out.

Have a great term!